

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

Title V Proposed Permit No. V-99-026

WESTLAKE PVC CORPORATION

CALVERT CITY, KENTUCKY 42029

June 7, 2000

REVIEWER: KUMAR POLE, P.E.

Plant I.D. 072-2600-0040

Application Log # F851

SOURCE DESCRIPTION:

The Westlake PVC Corporation is a synthetic organic chemical manufacturing industry (SOCMI) falling under SIC Group 28. Polyvinyl chloride (PVC) is produced at this facility by polymerization of vinyl chloride monomer (VCM) in batch reactors. Following polymerization, the PVC slurry is sent to steam stripping columns to separate the PVC from unreacted VCM which is recycled back into the process. Following the stripping operation, the PVC resin is dried, screened and finally sent to one or more of 16 PVC storage silos. Several grades of PVC are produced at this facility and the finished product is shipped out of the plant by truck and rail transport. The facility is currently permitted for a maximum production rate of 750,000 tons of PVC per year.

COMMENTS:

a. Type of control and efficiency:

Several control devices are used through the plant:

- i. Process equipment (reactors, strippers, recovery tanks, etc) - Most of the process equipment is controlled by 2 thermal oxidizers which are used to reduce the concentration of vinyl chloride in the exhaust stream to less than 10 ppm as required by 40 CFR 61 Subpart F (Vinyl Chloride NESHAP). A wet scrubber is used to reduce HCl emissions from the oxidizer exhaust.
- ii. PVC Dryers - All dryers at the plant are equipped with multiple-cyclones for control of particulate emissions. Additionally, the newest four dryers each have a scrubber following the cyclone.
- iii. PVC Storage Silos - Each silo is equipped with a baghouse for control of particulate emissions.

b. Emission factors and their source:

Emissions have been estimated using a combination of AP-42 emission factors, stack test data, and material balance. See the "Calculations" section of the application for details.

c. Applicable regulations:

The following regulations apply to this facility:

- i. 401 KAR 59:015, *New indirect heat exchangers*, applies to Boilers #1, #2, and #3.
- ii. 401 KAR 60:005, which incorporates by reference federal regulation 40 CFR 60 Subpart Dc, *Standards of performance for small industrial-commercial-institutional steam generating units*, applies to Boilers #1, #2, and #3.
- iii. 401 KAR 57:002, which incorporates by reference federal regulation 40 CFR 61 Subpart F, *National emission standard for vinyl chloride*, applies to the entire PVC plant.

- iv. 401 KAR 59:010, *New process operations*, applies to each PVC dryer (except Rotary Dryer #2) and each PVC storage silo.
- v. 401 KAR 61:020, *Existing process operations*, applies to Rotary Dryer #2 (EP 01).
- vi. 401 KAR 63:010, *Fugitive emissions*, applies to the PVC railcar loading operations and the cooling tower.

EMISSION AND OPERATING CAPS DESCRIPTION:

This facility is currently permitted under the following two permits:

- a. Permit F-94-017 (Revision 2) - Originally issued on March 3, 1995, this permit authorized expansion of the Westlake PVC plant from 182,000 tons of PVC per year to 300,000 tons PVC per year. Several new emission units were added to the plant during this expansion. Two minor revisions were subsequently made to this permit.
- b. Permit F-96-023 (Revision 1) - Originally issued on September 29, 1996, this permit authorized expansion of the Westlake PVC plant from 300,000 tons of PVC per year to 750,000 tons PVC per year. This expansion is not complete as of the date of issuance of this permit, as a result only some of the new emission units authorized by this permit have been added to the plant. One minor revision was subsequently made to this permit.

At the time of issuance of these permits, the facility was still classified as a minor source. In both cases, regulatory allowables for particulate matter, sulfur dioxide, and vinyl chloride were scaled down below the maximum allowable emission rates specified by regulation. Consequently, these permits were classified as “federally-enforceable synthetic minor permits”.

All “synthetic minor” permit requirements contained in these permits have been carried over to the Title V permit. Specifically, these are:

- i. For Boilers #1, #2, and #3, a lower allowable emission rate for sulfur dioxide and particulate matter than that specified by 401 KAR 59:015, *New indirect heat exchangers*.
- ii. Restriction on fuel usage rates at Boilers #1, #2, and #3.
- iii. For each dryer, a lower allowable emission rate for particulate matter than that specified by 401 KAR 59:010, *New process operations*.
- iv. For each PVC storage silo, a lower allowable emission rate for particulate matter than that specified by 401 KAR 59:010, *New process operations*.
- v. PVC production limited to 750,000 tons per year.
- vi. The vinyl chloride NESHAP (40 CFR 61 Subpart F) limits the weighted average residual vinyl chloride concentration in all grades of PVC to no more than 400 ppm (daily average), measured immediately after the stripping operation. Since vinyl chloride and VOC emissions are a function of the residual vinyl chloride concentration and the PVC production rate, the annual average residual vinyl chloride concentration in all grades of PVC is limited to 40 ppm to limit emissions of vinyl chloride and VOC.

OPERATIONAL FLEXIBILITY:

The expansion authorized by Permit F-96-023 (Revision 1) has not been completed as of the date of issuance of this permit during to prevailing economic conditions. Specifically, the three stripping columns authorized by that permit have not been installed. As a result, Westlake currently does not have adequate stripping capacity to reduce the annual average residual vinyl chloride concentration in all grades of PVC to 40 ppm or less as specified above.

In order to limit emissions of vinyl chloride and VOC to the levels set in Permit F-96-023 (Revision 1), an intermediate limit of 105 ppm has been established for the annual average residual vinyl chloride concentration in conjunction with an intermediate PVC production limit of 400,000. These two operating restrictions (VCM concentration and PVC production) together limit emissions of vinyl chloride and VOC to the same level as the 40 ppm and 750,000 tpy combination.

The permit contains the following language:

- a. Prior to completion of construction of the 3 new PVC stripping columns authorized by this permit, the dry PVC production rate shall not exceed 400,000 tons during any consecutive 12-month period and the weighted average residual vinyl chloride concentration in all grades of polyvinyl chloride resins processed through the existing stripping columns, measured immediately after the stripping operation is completed and prior to entering any of the dryers, may not exceed 105 ppm as a twelve (12) month average [Permit F-96-023 (Revision 1)].
- b. Upon completion of construction of the 3 new PVC stripping columns authorized by this permit, the dry PVC production rate maybe increased up to 750,000 tons during any consecutive 12-month period and the weighted average residual vinyl chloride concentration in all grades of polyvinyl chloride resins processed through the stripping operation, measured immediately after the stripping operation is completed and prior to entering any of the dryers may not exceed 40 ppm as a twelve (12) month average [Permit F-96-023 (Revision 1)].

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.